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EXAMINER

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| ART UNIT | PAPER NUMBER |
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2621

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DATE MAILED: 05/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/621,772

Applicant(s)

BERENZ ET AL.

Examiner

Hussein Akhavannik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Specification***

1. Claim 9 is objected to because of the following informalities:

In claim 9, "persons" should be changed to "person's".

Appropriate correction is required.

### ***Drawings***

2. New corrected drawings are required in this application because the figures are informal.

Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

3. The drawings are objected to because figures 1 and 5 have a hole punched through the reference numbers in the process of mounting the application. Applicant should supply formal drawings with a larger top margin to avoid the loss of information when mounting the drawings. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claims 18 and 21-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is not understood from reading the specification how an infrared detector is responsive to infrared radiation reflected from objects in the field of view in or around the vehicle with, when the objects are not in the field of view of the infrared beam, as recited by these claims.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 1-2, 4-7, 10-11, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Lemelson et al (U.S. Patent No. 6,400,835).

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Referring to claim 1,

i. An infrared source generating an infrared beam along a particular field-of-view in or around the vehicle is explained by Lemelson et al in column 6, line 65 to column 7, line 7 as an infrared laser.

ii. An infrared detector responsive to infrared radiation reflected from objects in the field-of-view of the infrared beam generating image signals from the reflected infrared radiation is explained by Lemelson et al in column 5, lines 19-30 and illustrated in figures 1 and 3. Lemelson et al explains that an infrared camera (12b) may be used in conjunction with the regular video camera (12a) to image a face in a vehicle (11). Lemelson et al explain that an infrared camera would be advantageous to a regular camera, as the infrared image is less susceptible to minor changes in the face, thereby allowing a more consistent detection of the face.

iii. A processor responsive to the image signals from the detector including face recognition software that acquires and tracks facial features of a person from the image signals is explained by Lemelson et al in column 5, line 37 to column 6, line 18.

Lemelson et al explain that the face images are compared with the stored set of face images to determine a "match". Causing a vehicle operation to be performed if a person's face is detected is explained by Lemelson et al in column 6, lines 32-36.

Lemelson et al explain that once a "match" has been determined, the ignition control circuit is completed, allowing operation of the vehicle.

Referring to claim 2, the processor comparing a detected image of a person's face with stored images to identify the person is explained by Lemelson et al in column 6, lines 1-12. The stored images are explained as the stored subsets of each of the authorized drivers.

Referring to claim 4, monitoring driver gestures to perform a particular vehicle function if the driver's face is detected is explained by Lemelson et al in column 15, line 48 to column 16, line 25. The facial recognition system of Lemelson et al continuously monitors the authorized user in order to start the car. If the authorized user is continually recognized, then the car is allowed to start.

Referring to claim 5, causing a vehicle system to be automatically adjusted in response to detecting the person's face corresponds to claim 2. Lemelson et al explain that the ignition control circuit is closed when a "match" is detected between the face image of an operator and a stored face image. Lemelson et al further explain that the settings, such as seat position, in a vehicle can be automatically changed depending on the driver that has been detected in column 11, line 59 to column 12, line 10.

Referring to claim 6, the system recording the person's face if it does not match a face stored in the processor is explained by Lemelson et al in column 5, lines 42-44. When the recording system is first installed, there are no recordings stored, so the system stores face images of the authorized users. The system of Lemelson et al can then supplement the database when additional users are authorized.

Referring to claim 7, the processor causing the vehicle to start if the detected image matches a particular stored image is explained by Lemelson et al in the abstract. Lemelson et al explain that the facial recognition system maybe used to create an auto-starting car.

Referring to claim 10, an infrared filter positioned in front of the detector is inherent in the camera 12 in figure 3 of Lemelson et al. The first section of the camera, 12A, captures conventional signals from the scene being imaged and the second section, 12B, captures infrared signals. In order to capture only the infrared spectrum, section 12B of the camera would inherently have to use an infrared filter so that the frequencies outside the infrared spectrum are not captured.

Referring to claim 11, the infrared detector including a pixel array of photodiodes is explained by Lemelson et al in column 6, line 65 to column 7, line 7. Lemelson explains that the camera (12) may be made of a CCD scanning device. Therefore, the section of the camera sensitive to infrared light, 12B, will also constitute a CCD scanning device. A CCD scanning device inherently includes a pixel array of photodiodes that measure light levels incident on the device.

Referring to claim 14, the detector including a pixel array of diodes corresponds to claim 11. The section of the camera sensitive to ambient light, 12A, may also be made up of a CCD scanning device.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lemelson et al in view of Evans et al (E.P. Application No. 0,924,123 A2).

Referring to claim 3, identifying a driver's face and causing a vehicle door to automatically unlock if the driver's face is detected are not explicitly explained by Lemelson et al. However, Evans et al do explain unlocking a vehicle door when an authorized user has been determined in column 2, lines 22-32. The system of Evans et al uses fingerprints in order to determine an authorized user, whereas the system of Lemelson et al uses facial recognition in order to identify an authorized user. Both systems ultimately minimize unauthorized by determining if the user is authorized to use the vehicle and can therefore be substituted for each other. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the facial recognition system of Lemelson et al to unlock the doors of a vehicle for an authorized user.

10. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lemelson et al in view of Breed et al (U.S. Patent No. 5,845,000).

Referring to claim 8, the processor controlling the vehicle speed if a detected image is of a particular person's face that is stored is not explicitly explained by Lemelson et al. Though Lemelson et al do explain changing the settings of a car according to the recognized user in column 11, line 59 to column 12, line 10, they do not explain controlling the vehicle speed. Breed et al do explain bringing the vehicle to a stop in response to driver motions, namely the eyes of the user, in column 11, lines 40-61. By bringing the vehicle to a stop, the processor would obviously have to control the vehicle speed in response to the images of a user's face. Breed et al explain that such control would be advantageous because the speed of the vehicle may be lowered when the user is drowsy or unconscious. Lemelson et al explain controlling the parts of the vehicle engine so that the car may be automatically started in column 16, lines 9-25,



so embedding a speed control means would be possible in the system of Lemelson et al.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to control the vehicle speed if a detected image is of a particular person's face so that the vehicle is operated in safer conditions.

Referring to claim 9, the processor tracking and monitoring the person's eyes is not explicitly explained by Lemelson et al. However, Breed et al do explain tracking the driver's eye motions in column 11, line 62 to column 12, line 16. When a user is drowsy or sleeping, his/her eyes are usually closed or moving at a much slower rate. Because the system of Lemelson images the eyes of a user, it would have been obvious to monitor the user's eyes in order to track whether the user has fallen asleep. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to monitor the user's eyes in the system of Lemelson et al.

11. Claims 12-13, 16-18, and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lemelson et al in view of Merrick et al (U.S. Patent No. 5,348,005).

Referring to claim 12, the infrared source being pulsed on for a predetermined time at predetermined intervals is not explicitly explained by Lemelson et al. However, Merrick et al do explain an infrared light source being pulsed at 160 Hz in column 2, lines 40-63 and in figure 4. Merrick et al pulse the light sources so that the background light (or ambient light) in the imaging setting may be determined and subtracted from the infrared values recorded. Pulsed light sources embedded into the system of Lemelson et al will allow for a reproducible reading for a specific user in any image setting. Therefore, it would have been obvious to one of

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ordinary skill in the art at the time the invention was made to use pulsed light sources in the facial recognition system of Lemelson et al to improve the reliability of the system.

Referring to claim 13, the pulsed source and the detector being synchronized such that a difference of successive frames represents an image free of ambient light variations is not explicitly explained by Lemelson et al. However, Merrick et al do explain synchronizing an infrared, red, and ambient light source in order to subtract out ambient light in column 2, lines 40-63. Merrick et al illustrates the pulsing of the light sources and determining the ambient light offset in figure 4. Subtracting the ambient light level from the red and infrared light levels is important in the system of Merrick et al because the oxygen saturation is determined by and extremely sensitive to the fluctuation in the absorption of red and infrared light. So, depending on the setting of the imaging, ambient light can fluctuate greatly and artificially change the oxygen saturation readings. Therefore, by subtracting the recorded ambient light levels, the oxygen saturation calculation will be more accurate and reproducible. The face recognition system of Lemelson et al also suffers from the same fault as Oxygen saturation recording system of Merrick et al in that the ambient light may distort the image values recorded from the biological tissue. The system of Lemelson et al also provides both an ambient light camera and an infrared camera (corresponding to claim 1ii), similar to the system of Merrick et al. Thus, the system of Lemelson et al may easily be modified to perform the same method as explained by Merrick et al to remove the ambient light from the recorded face images. Such a subtraction would similarly improve the accuracy and repeatability of a correct "match" of an authorized user, which is vital in the system of Lemelson et al. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to synchronize a pulsed source

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and the detector so that the difference of successive frames represents an image free of ambient light variations as ambient light may distort the result of determining a match between two images taken in different settings.

Referring to claim 16,

- i. An infrared source generating an infrared beam along a particular field-of-view in or around the vehicle corresponds to claim 1i.
- ii. The infrared source being pulsed on and off at predetermined intervals corresponds to claim 12.
- iii. An infrared detector responsive to infrared radiation reflected from objects in the field-of-view of the infrared beam generating image signals from the reflected infrared radiation corresponds to claim 1ii.
- iv. A processor responsive to the image signals from the detector including face recognition software that acquires and tracks facial features of a person from the image signals corresponds to claim 1iii.
- v. Comparing the detected image of a person's face with stored images to identify the person corresponds to claim 2.
- vi. An alarm sounding when the identified face does not match a stored image is explained by Lemelson et al in column 12, lines 34-42. Lemelson et al explain that a car alarm maybe sounded in the face is not identified in a certain time period.

Referring to claim 17, the processor providing a recording of the image if the detected image does not match a stored image corresponds to claim 6. Furthermore, Lemelson et al

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explain that their face recognition system may save the face of the unauthorized user so that a record may be kept of the intruder in column 17, lines 50-67.

Referring to claim 18,

- i. An infrared source generating an infrared beam along a particular field-of-view in or around the vehicle corresponds to claim 1i.
- ii. The infrared source being pulsed on and off at predetermined intervals corresponds to claim 12.
- iii. An infrared detector responsive to infrared radiation reflected from objects in the field of view in or around the vehicle is illustrated by Lemelson et al in figure 1. The camera (12) of figure 1 contains an infrared detector and is responsive to object in the vehicle.
- iv. An infrared detector responsive to infrared radiation reflected from objects in the field-of-view of the infrared beam generating image signals from the reflected infrared radiation corresponds to claim 1ii.
- v. A processor responsive to the image signals from the detector including face recognition software that acquires and tracks facial features of a person from the image signals corresponds to claim 1iii.
- vi. Comparing the detected image of a person's face with stored images to identify the person corresponds to claim 2.
- vii. The processor causing a vehicle system to be automatically set in response to detecting the person's face corresponds to claim 5.

Referring to claim 21,

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- i. An infrared source generating an infrared beam along a particular field-of-view in or around the vehicle corresponds to claim 1i.
- ii. The infrared source being pulsed on and off at predetermined intervals corresponds to claim 12.
- iii. An infrared detector responsive to infrared radiation reflected from objects in the field of view in or around the vehicle is illustrated by Lemelson et al in figure 1. The camera (12) of figure 1 contains an infrared detector and is responsive to object in the vehicle.
- iv. An infrared detector responsive to infrared radiation reflected from objects in the field-of-view of the infrared beam generating image signals from the reflected infrared radiation corresponds to claim 1ii.
- v. A processor responsive to the image signals from the detector including face recognition software that acquires and tracks facial features of a person from the image signals corresponds to claim 1iii.
- vi. Comparing the detected image of a person's face with stored images to identify the person corresponds to claim 2.
- vii. The processor causing the vehicle to start if the detected image is determined to be the vehicle driver corresponds to claim 7.

Referring to claim 22,

- i. An infrared source generating an infrared beam along a particular field-of-view in or around the vehicle corresponds to claim 1i.

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- ii. The infrared source being pulsed on and off at predetermined intervals corresponds to claim 12.
  - iii. An infrared detector responsive to infrared radiation reflected from objects in the field of view in or around the vehicle is illustrated by Lemelson et al in figure 1. The camera (12) of figure 1 contains an infrared detector and is responsive to object in the vehicle.
  - iv. An infrared detector responsive to infrared radiation reflected from objects in the field-of-view of the infrared beam generating image signals from the reflected infrared radiation corresponds to claim 1ii.
  - v. A processor responsive to the image signals from the detector including face recognition software that acquires and tracks facial features of a person from the image signals corresponds to claim 1iii.
  - vi. Comparing the detected image of a person's face with stored images to identify the person corresponds to claim 2.
  - vii. The processor causing the vehicle speed to be controlled in response to detecting a particular person corresponds to claim 8.
12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lemelson et al in view of Merrick et al and Evans et al.

Referring to claim 15,

- i. An infrared source generating an infrared beam along a particular field-of-view in or around the vehicle corresponds to claim 1i.

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- ii. The infrared source being pulsed on and off at predetermined intervals corresponds to claim 12.
  - iii. An infrared detector responsive to infrared radiation reflected from objects in the field-of-view of the infrared beam generating image signals from the reflected infrared radiation corresponds to claim 1ii.
  - iv. A processor responsive to the image signals from the detector including face recognition software that acquires and tracks facial features of a person from the image signals corresponds to claim 1iii.
  - v. Comparing the detected image of a person's face with stored images to identify the person corresponds to claim 2.
  - vi. The processor identifying a driver's face from the comparison and causing a vehicle door to automatically unlock if the driver's face is detected corresponds to claim 3.
13. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lemelson et al in view of Merrick et al and Breed et al.

Referring to claim 19,

- i. An infrared source generating an infrared beam along a particular field-of-view in or around the vehicle corresponds to claim 1i.
- ii. The infrared source being pulsed on and off at predetermined intervals corresponds to claim 12.

- iii. An infrared detector responsive to infrared radiation reflected from objects in the field-of-view of the infrared beam generating image signals from the reflected infrared radiation corresponds to claim 1ii.
- iv. A processor responsive to the image signals from the detector including face recognition software that acquires and tracks facial features of a person from the image signals corresponds to claim 1iii.
- v. Comparing the detected image of a person's face with stored images to identify the person corresponds to claim 2.
- vi. The processor identifying a driver's face from the comparison and monitoring the driver commands to perform a particular vehicle function is corresponds to claim 8. The system of Lemelson et al is explained to be modified to monitor the commands of the eye and controlling the vehicle speed.

Referring to claim 20, the processor detecting the person after the vehicle is locked is explained by Lemelson et al in column 11, lines 13-22. Lemelson et al explain that their system detects the person once the brake pedal is depressed. The vehicle may be locked when the user depresses the pedal, so the processor would perform the detection after the vehicle is locked.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Grantz (U.S. Patent No. 6,252,978) – To exhibit imaging a face to authenticate a user of a vehicle.

Ueno et al (U.S. Patent No. 5,293,427) – To exhibit determining the position of an eye in an image of a driver's face.



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Ishikawa et al (U.S. Patent No. 4,625,329) – To exhibit emitting an infrared light in order to determine the position of a driver of a vehicle.

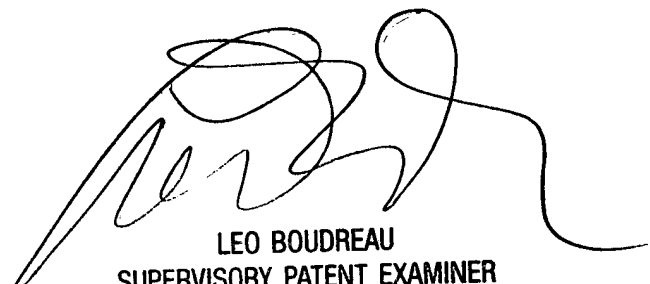
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hussein Akhavannik whose telephone number is (703)306-4049. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on (703)305-4706. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

Hussein Akhavannik  
May 7, 2003

H.A.



LEO BOUDREAU  
SUPERVISORY PATENT EXAMINER  
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